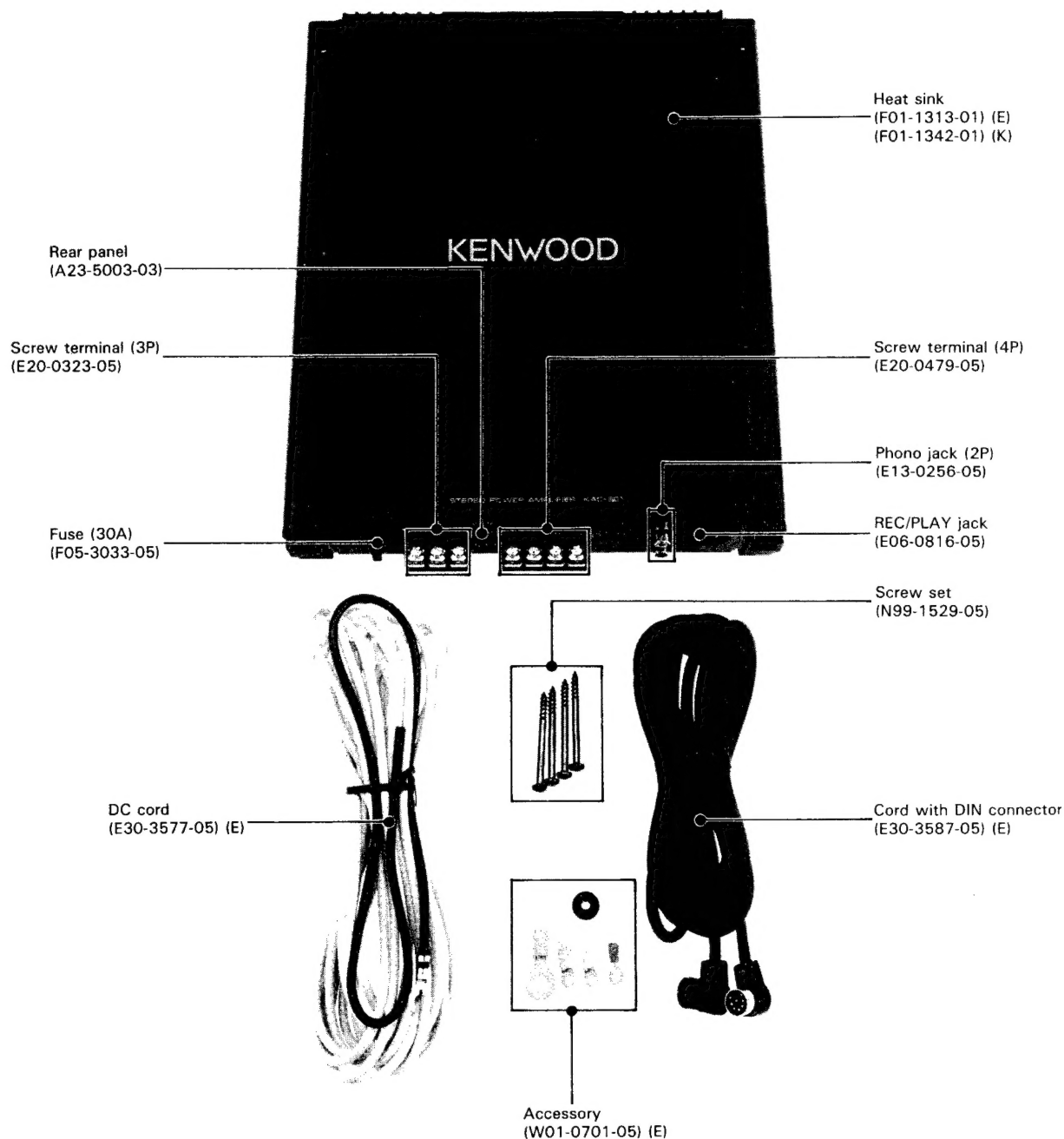


# KAC-921

## SERVICE MANUAL





CIRCUIT DESCRIPTION

FUNCTION OF EACH IC'S  
AUDIO UNIT

Ref. No.	Component	Use/Function	Operation/Condition/Compatibility
IC1	KKM60	Isolation amplifier	Eliminates any car noise entering to the amplifier input.
IC2	μPC4570C	Operation amplifier	Sub-woofer LPF and bridge's inverter
IC3	μPD4066BC	Analog switch	Connects in bridge when Q3 is ON and Q48 is OFF.
IC4	μPC494C	Switching regulator	DC/DC converter's oscillator. Dead time is provided against switching wave.
IC5	μPC1237HA	Protection	Overload protection, DC offset, P-CON detection
Q1,2	2SD1302	Input mute	At amplifier ON/OFF, operates at a timing earlier than relays to protect the relay contacts.
Q4,5	DTA124EFF DTC124EFF	Mute drive	Q4 goes ON by a full-wave rectification circuit of D5-D8 and Q5.
Q7,8	2SK389	Input differential amplifier	Input is applied to one input terminal and that output is fed back to the other input terminal to determine the amplifier gain, and at the same time, the output of the speaker terminal becomes 0 in terms of DC.
Q9~12	2SA992(F,E)	2-stage differential amplifier	
Q13,14	2SC2631(R,S)	Cascode stage	
Q15,16	2SA1123(Q,R)	Current mirror	Third-stage differential load
Q17	2SC3419	Temperature compensation (L-ch)	
Q18	2SC3419	Temperature compensation (R-ch)	
Q19~22	2SC2631(R,S)	Third-stage differential amplifier	
Q23~26	2SC2590(Q,R) 2SA1110(Q,R)	Power amplifier drive	
Q27~30	2SC4387*5 2SA1672*5	Power stage	
Q31,32	2SC1845(F,E)	Current detection	Detects the overcurrent to operate the protection IC.
Q33	2SD1266(Q,P)	AVR	+ 20 V constant voltage
Q34	2SB941	AVR	- 20 V constant voltage
Q35~40	2SC3300	Switching power stage	
Q41,42	2SC2654(L,K)	Switching driver	
Q43	2SA992(F,E)	Current detection	Detects the overcurrent to operate the protection IC.
Q44	2SA1534(A)(R,S)	Power switch	Supplies a current to IC1.
Q45	2SC945(A)(Q,P)	P-CON "ON" detection	
Q46,47	2SA733(A)(Q,P) 2SC3940(A)(R,S)	Fan drive	When TH3 detects 80°C, go ON to rotate the fan. (With hysteresis)

BRIDGE CIRCUIT:

Due to S2...  
For 4/2 ohm: Q3 OFF, Q48 ON  
For bridge: Q3 ON, Q48 OFF  
Thus, controls the analog switch (IC3) to let the L-ch signal enter to the bridge's inverter, from which the R-ch output is taken.

FAN CIRCUIT:

With rise in temperature, the resistance value of thermistor TH3 lowers so that Q46 and Q47 go ON. Owing to a positive feed-back circuit of D33 and R150, ON/OFF level hysteresis is provided.

ADJUSTMENT/REGLAGES/ABGLEICH

ADJUSTMENT

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	AMPLIFIER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
Connect a cassette deck.							
1	IDLE CURRENT	—	Connect a DC voltmeter to: CN5(L,R)	VOLUME: 0	VR3 (L) VR4 (R)	2mV	(a)

(Note) The DC power shall have a large capacity (of 10 A or more). If it is smaller, the DC-DC converter may not operate.

REGLAGES

N°	ITEM	REGLAGE DE L'ENTREE	REGLAGE DE LA SORTIE	REGLAGE DE L'AMPLIFICATEUR	POINT L'ALIGNEMENT	ALIGNER POUR	FIG.
Raccorder une platine à cassette.							
1	COURANT DE POLARISATION	—	Raccorder un voltmètre CC à: CN5(C,D)	VOLUME: 0	VR3 (C) VR4 (D)	2mV	(a)

(Remarque) L'alimentation CC doit avoir une grande capacité (de 10 A ou plus). Si elle est inférieure, le convertisseur CC-CC risque de ne pas fonctionner.

ABGLEICH

NR.	GEGENSTAND	EINGANGS-EINSTELLUNG	AUSGANGS-EINSTELLUNG	VERSTÄRKER EINSTELLUNG	ABGLEICH-PUNKTE	ABGLEICHEN FÜR	ABB.
Ein Kassettendeck anschließen.							
1	LEERLAUFSTROM	—	Einen Gleichstrom-Voltmeter anschließen an: CN5(L,R)	VOLUME: 0	VR3 (L) VR4 (R)	2mV	(a)

(Hinweis) Die Gleichspannung muß eine hohe Kapazität (von 10 A oder mehr) aufweisen, weil sonst der Gleichstrom-Konverter eventuell nicht arbeitet.

KAC-921(K) (E/F/G)

VOLTAGE TABLES

AUDIO UNIT  
(X09-3040-10)

Q1, 2, 5,  
10-12,  
14-18, 20,  
22, 31, 32,  
38-40, 42,  
45-47

E	—
C	—
B	—

Q3, 48
E 8V
C —
B —

Q4
E 20V
C —
B —

Q7
G1 —
G2 —
D1 13.5V
D2 —
S1 —
S2 —

Q8
G1 —
G2 —
D1 —
D2 —
S1 —
S2 —

Q9
E —
C —
B 13.5V

Q13
E —
C —
B 0V

Q19
E -39V
C -3V
B —

Q21
E -39V
C -1.2V
B —

Q23, 24
E —
C 40V
B —

Q25, 26
E —
C -40V
B —

Q27, 28
E —
C 40 (26)V
B —

Q29, 30
E —
C -40 (-26)V
B —

Q33
E 20V
C 34V
B —

Q34
E -20V
C -34V
B —

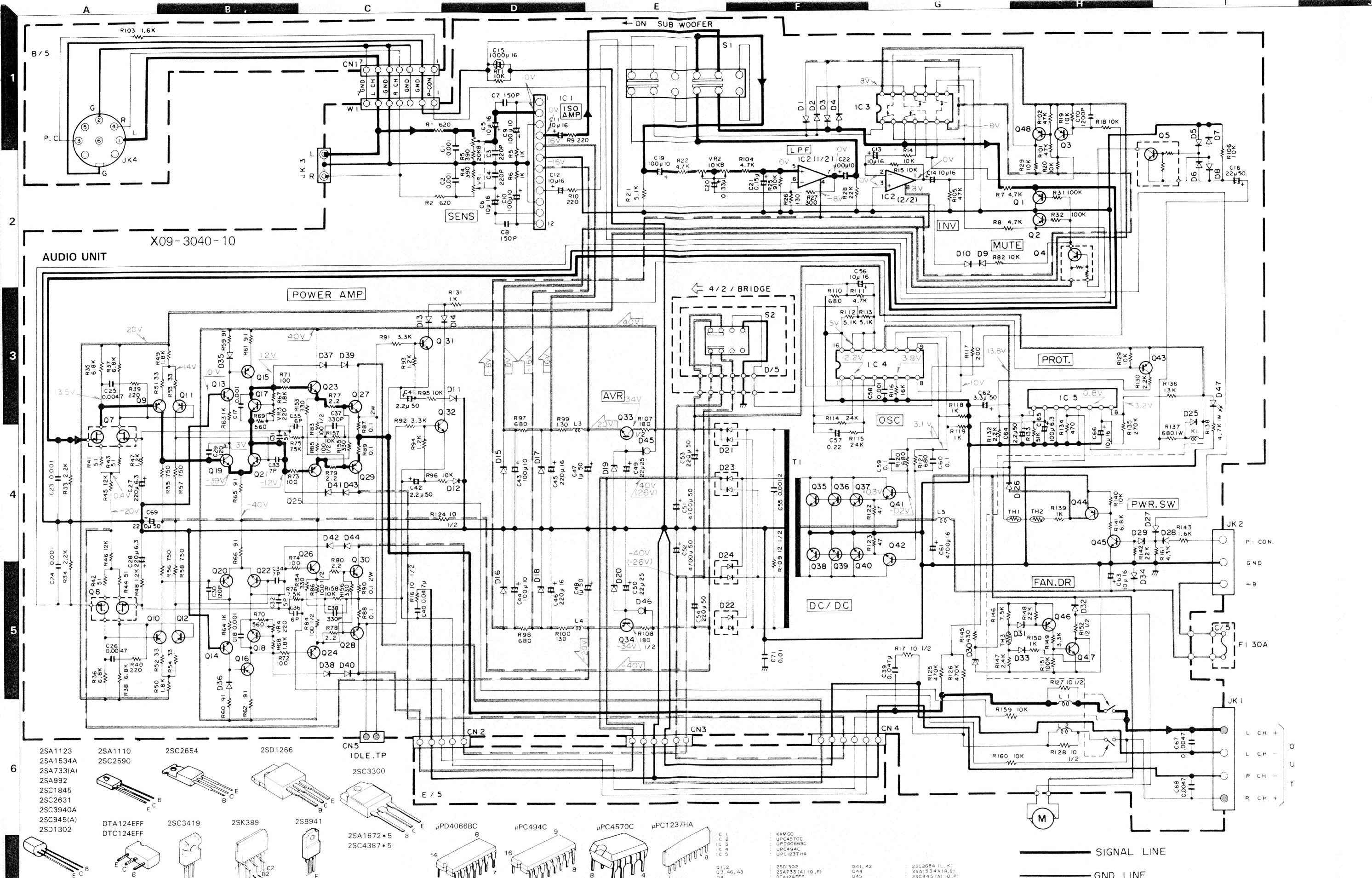
Q35-37
E —
C —
B 0.3V

Q41
E 0.3V
C —
B -0.2V

Q43
E 34V
C —
B —

Q44
E 13.8V
C —
B —





- 2SA1123  
2SA1534A  
2SA733(A)  
2SA992  
2SC1845  
2SC2631  
2SC3940A  
2SC945(A)  
2SD1302
- 2SA1110  
2SC2590
- 2SC2654
- 2SD1266
- 2SC3300
- 2SC3419
- 2SK389
- 2SB941
- 2SA1672\*5  
2SC4387\*5
- DTA124EFF  
DTC124EFF
- μPD4066BC
- μPC494C
- μPC4570C
- μPC1237HA

DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

— SIGNAL LINE  
— GND LINE  
+ B LINE  
- B LINE

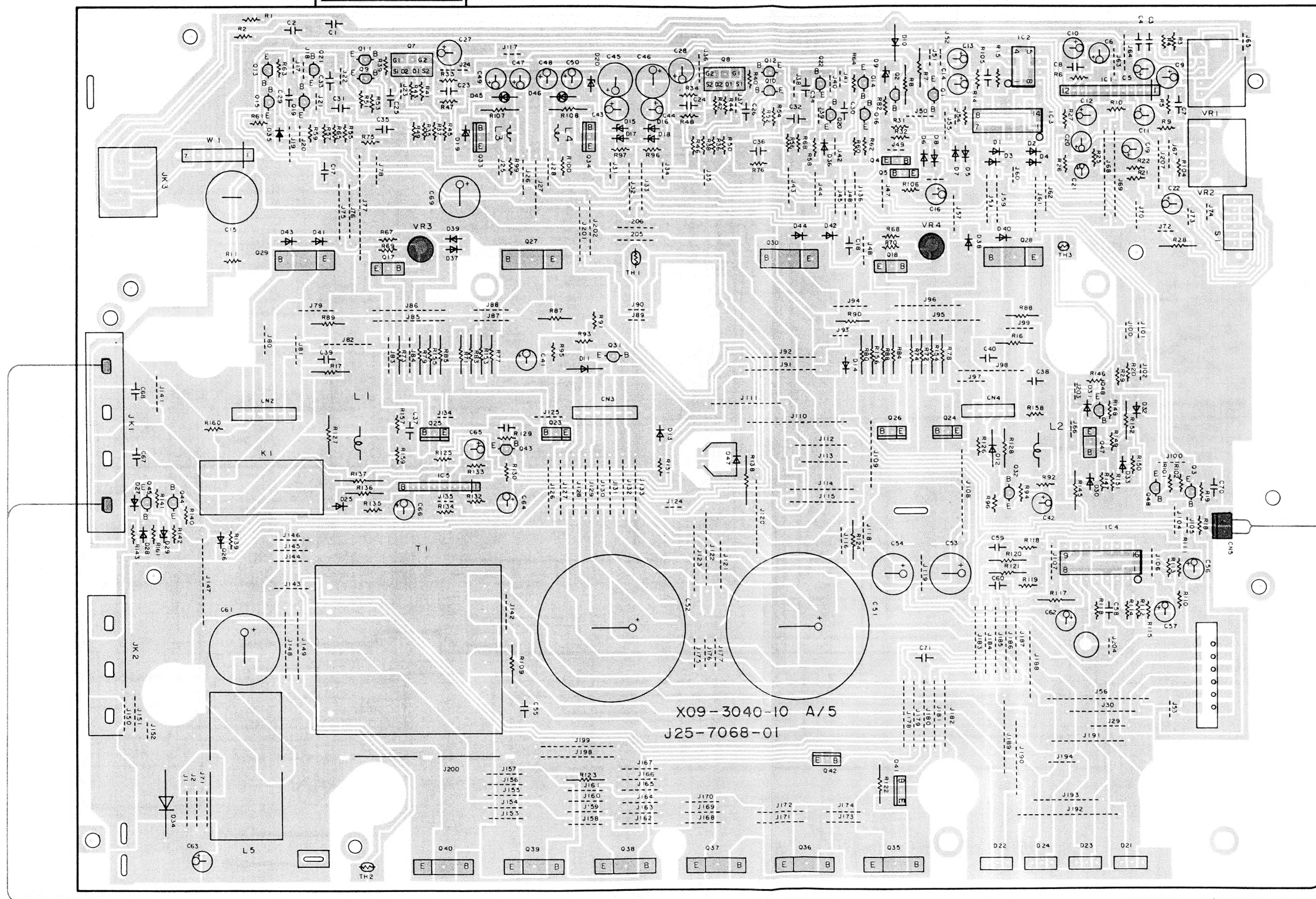
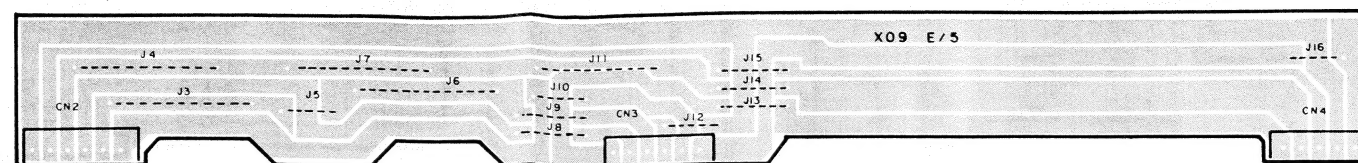
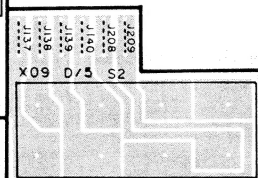
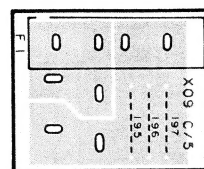
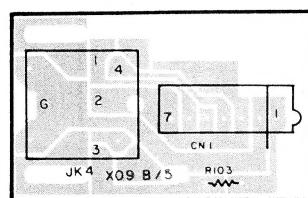
**KAC-921**  
**KENWOOD**

Y08-3910-10



# PC BOARD (Foil side view)

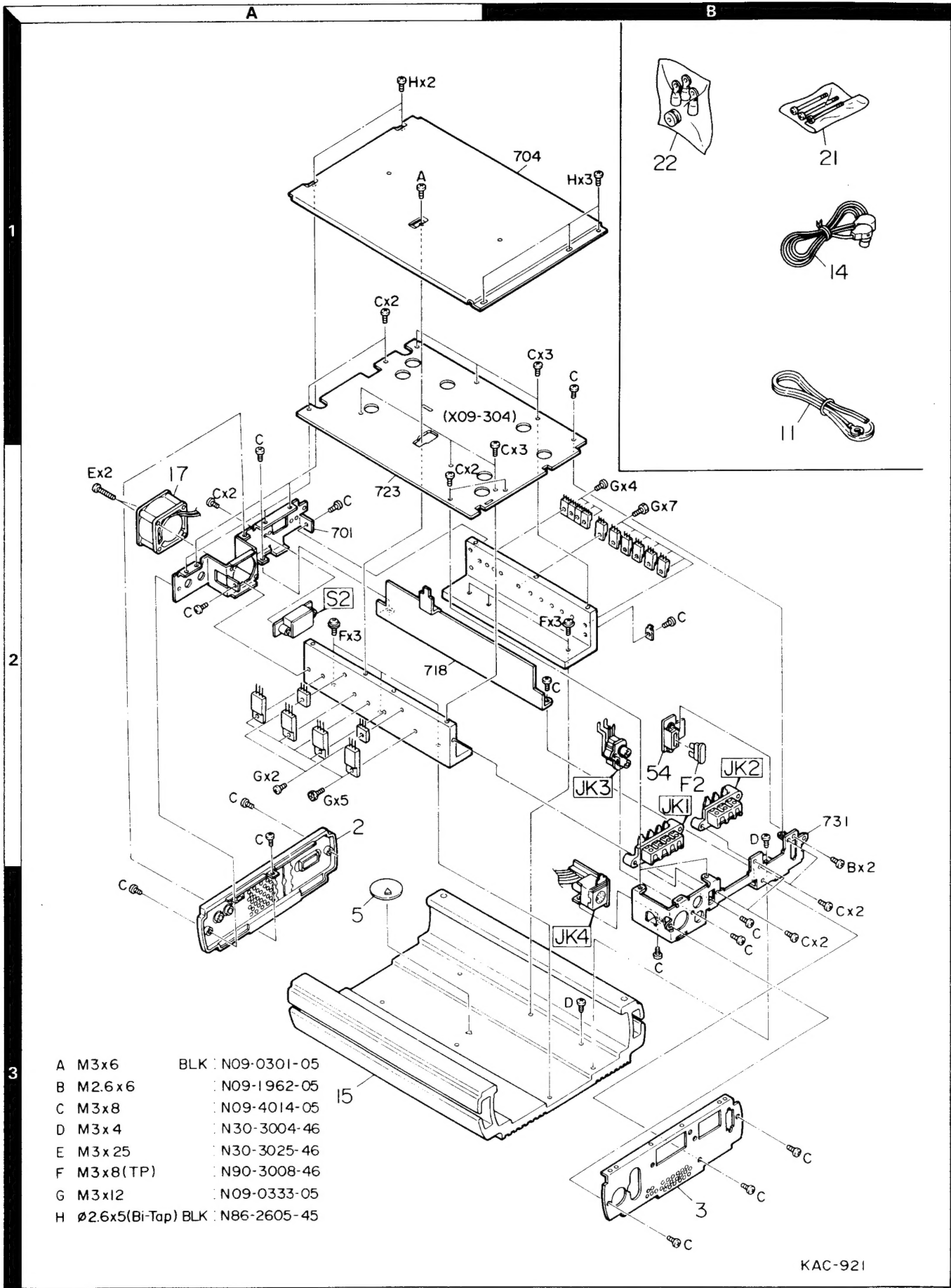
AUDIO UNIT (X09-3040-10)



(a) Idle current  
2 mV  
DC voltmeter

Refer to the schematic diagram for the values of resistors and capacitors.

EXPLODED VIEW



- |                      |                   |
|----------------------|-------------------|
| A M3x6               | BLK : N09-0301-05 |
| B M2.6x6             | : N09-1962-05     |
| C M3x8               | : N09-4014-05     |
| D M3x4               | : N30-3004-46     |
| E M3x25              | : N30-3025-46     |
| F M3x8(TP)           | : N90-3008-46     |
| G M3x12              | : N09-0333-05     |
| H Ø2.6x5(Bi-Tap) BLK | : N86-2605-45     |

KAC-921

PARTS LIST

× New Parts  
Parts without Parts No. are not supplied.  
Les articles non mentionnes dans le Part No. ne sont pas fournis.  
Teile ohne Parts No. werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
KAC-921						
2	2A	*	A20-7530-02	PANEL		
3	3B	*	A23-5005-13	REAR PANEL		
5	3A	*	B19-0818-04	LIGHTING BOARD		
-			B44-2163-04	UPC CODE LABEL		
-			B44-2164-04	UPC CODE LABEL		
-			B46-0100-10	WARRANTY CARD		
-		*	B50-7920-00	INSTRUCTION MANUAL	K	
-		*	B50-7921-00	INSTRUCTION MANUAL	E	
-			B58-0803-13	CAUTION CARD (210X148,DBP)	E	
-			B58-1209-04	CAUTION CARD		
11	1B		E30-3577-05	DC CORD	E	
14	1B		E30-3587-05	CORD WITH DIN CONNECTOR	E	
15	3A	*	F01-1342-01	HEAT SINK	K	
15	3A	*	F01-1313-01	HEAT SINK	E	
17	2A	*	F09-1202-05	FAN		
F2	2B		F05-3033-05	FUSE (30A)		
-		*	F07-1008-04	TERMINAL COVER (3P)	E	
-		*	H01-9072-04	ITEM CARTON CASE		
-		*	H03-3086-04	OUTER CARTON CASE		
-			H10-4314-02	POLYSTYRENE FOAMED FIXTURE		
-			H25-0321-04	PROTECTION BAG (600X315X0.03)		
-			H25-0336-04	PROTECTION BAG (170X250X0.03)		
21	1B		N99-1529-05	SCREW SET		
A	1A		N09-0301-05	TAPTITE SCREW (3X6)		
B	3B		N09-1962-05	TAPTITE SCREW (M2.6X6)		
C	1B, 3B	*	N09-4014-05	TAPTITE SCREW (3X8)		
D	2B, 3B		N30-3004-46	PAN HEAD MACHINE SCREW		
E	2A		N30-3025-46	PAN HEAD MACHINE SCREW		
F	2A, 2B		N90-3008-46	TP HEAD MACHINE SCREW		
H	1A, 1B		N86-2605-45	SCREW		
22	1B		W01-0701-05	ACCESSORY	E	
AUDIO UNIT (X09-3040-10)						
D47			B30-1321-05	LED(RED)		
C1 ,2			CF92FV1H102J	MF 1000PF J		
C3 ,4			CC45FSL1H221J	CERAMIC 220PF J		
C5 ,6			CE04DW1C100M	ELECTRO 10UF 16WV		
C7 ,8			CC45FSL1H151J	CERAMIC 150PF J		
C9 ,10			CE04DW1A101M	ELECTRO 100UF 10WV		
C11 -14			CE04DW1C100M	ELECTRO 10UF 16WV		
C15			C90-1630-05	NP-ELEC 1000UF 16WV		
C16			CE04DW1H220M	ELECTRO 22UF 50WV		
C17 ,18			CF92FV1H102J	MF 1000PF J		
C19			CE04DW1A101M	ELECTRO 100UF 10WV		
C20			CE04DW1HR33M	ELECTRO 0.33UF 50WV		
C21			CE04CW1HR15M	ELECTRO 0.15UF 50WV		
C22			CE04DW1A101M	ELECTRO 100UF 10WV		
C23 ,24			CF92FV1H102J	MF 1000PF J		
C25 ,26			CF92FV1H472J	MF 4700PF J		
C27 ,28			C90-1640-05	ELECTRO 100UF 10WV		
C29 ,30			CC45FSL1H121J	CERAMIC 120PF J		
C31 ,32			CC45FSL1H050C	CERAMIC 5.0PF C		
C33 ,34			CC45FSL1H070D	CERAMIC 7.0PF D		

E: Scandinavia & Europe K: USA P: Canada W:Europe  
U: PX(Far East, Hawaii) T: England M: Other Areas  
UE: AAFES(Europe) X: Australia



## PARTS LIST

\* New Parts

Parts without Parts No. are not supplied.

Les articles non mentionnés dans le Parts No. ne sont pas fournis.

Teile ohne Parts No. werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
C35 ,36 C37 ,38 C39 ,40 C41 ,42 C43 ,44			CC45FSL1H060D CC45FSL1H331J CF92V1H473J CE04DW1H2R2M CE04DW1A101M	CERAMIC 6.0PF D CERAMIC 330PF J MF 0.047UF J ELECTRO 2.2UF 50WV ELECTRO 100UF 10WV		
C45 ,46 C47 ,48 C49 ,50 C51 ,52 C53 ,54		*	CE04DW1C221M CE04DW1H010M CE04DW1E220M C90-1618-05 C90-2519-05	ELECTRO 220UF 16WV ELECTRO 1.0UF 50WV ELECTRO 22UF 25WV ELECTRO 4700UF 50WV ELECTRO 220UF 50WV		
C55 C56 C57 C58 C59 ,60			CF92FV1H122J CE04DW1C100M CE04DW1HR22M CF92FV1H102J CF92FV1H104J	MF 1200PF J ELECTRO 10UF 16WV ELECTRO 0.22UF 50WV MF 1000PF J MF 0.10UF J		
C61 C62 C63 C64 C65			C90-1633-05 CE04DW1H3R3M CE04DW1C100M CE04DW1H2R2M CE04DW0J101M	ELECTRO 4700UF 16WV ELECTRO 3.3UF 50WV ELECTRO 10UF 16WV ELECTRO 2.2UF 50WV ELECTRO 100UF 6.3WV		
C66 C67 ,68 C69 C70 C71			CE04DW1C100M CF92FV1H472J CE04DW1H221M CF92FV1H122J CF92FV1H102J	ELECTRO 10UF 16WV MF 4700PF J ELECTRO 220UF 50WV MF 1200PF J MF 1000PF J		
J200 JK1 JK2 JK3 JK4	2B 2B 2B 3B	* * * *	E29-0186-05 E20-0479-05 E20-0323-05 E13-0256-05 E06-0816-05	LEAD PLATE SCREW TERMINAL BOARD(4P) SCREW TERMINAL BOARD(3P) PHONE JACK (2P) REC/PLAY JACK		
54	2B		J13-0071-05	FUSE HOLDER		
L1 ,2 L3 ,4 L5 T1		* * * *	L39-0085-05 L33-0344-15 L33-0903-05 L19-0503-05	PHASE-COMPENSATION COIL CHOKE COIL LINE FILTER COIL TRANSFORMER FOR CONVERTER		
C G	2B,3B 2A,2B	*	N09-4014-05 N09-0333-05	TAPTITE SCREW (3X8) TAPPING SCREW (3X12)		
R16 ,17 R83 -86 R87 -90 R107,108 R109			RD14DB2H100J RD14DB2H101J R92-0205-05 RD14DB2H181J RD14DB2H120J	SMALL-RD 10 J 1/2W SMALL-RD 100 J 1/2W METAL-PLATE 0.1 K 2W SMALL-RD 180 J 1/2W SMALL-RD 12 J 1/2W		
R124 R127,128 R137 R138 R152			RD14DB2H100J RD14DB2H100J RS14KB3A681J RS14KB3A472J RD14DB2H120J	SMALL-RD 10 J 1/2W SMALL-RD 10 J 1/2W FL-PROOF RS 680 J 1W FL-PROOF RS 4.7K J 1W SMALL-RD 12 J 1/2W		
VR1 ,2 VR3 ,4		*	R10-3633-05 R12-0092-05	POTENTIOMETER(20K) TRIMMING POT.(220 ㏪)		
K1 S1 S2	2A	*	S51-2078-05 S31-4642-05 S31-2622-05	MAGNETIC RELAY SLIDE SWITCH SLIDE SWITCH		

E: Scandinavia &amp; Europe K: USA P: Canada W: Europe

U: PX(Far East, Hawaii) T: England M: Other Areas

UE: AAFES(Europe) X: Australia

## PARTS LIST

\* New Parts

Parts without Parts No. are not supplied.

Les articles non mentionnés dans le Parts No. ne sont pas fournis.

Teile ohne Parts No. werden nicht geliefert.

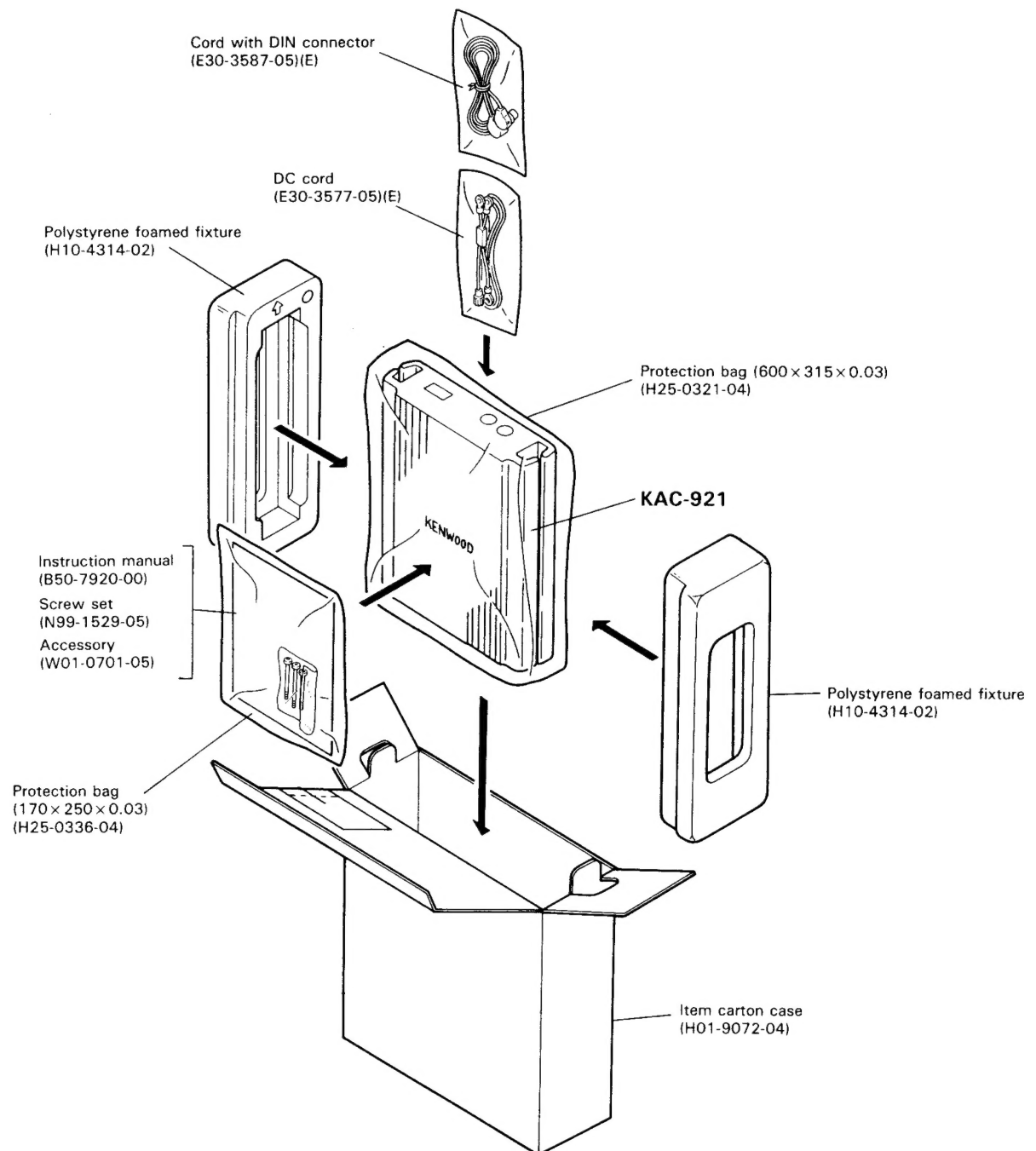
Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
D1 -8 D9 D10 -12 D13 ,14 D15 ,16			1SS176 RD5.1JS(B2) 1S2076A 1SS176 RD8.2JS(B2)	DIODE ZENER DIODE DIODE DIODE ZENER DIODE		
D17 ,18 D19 ,20 D21 D22 D23			RD16JS(B) RD20JS(B) FMU21S FMU21R FMU21S	ZENER DIODE ZENER DIODE DIODE DIODE DIODE		
D24 D25 -28 D29 D30 D31			FMU21R 1SS176 RD5.1JS(B2) RD8.2JS(B2) RD5.1JS(B2)	DIODE DIODE ZENER DIODE ZENER DIODE ZENER DIODE		
D32 ,33 D34 D35 -44 D45 ,46 IC1			1SS176 RM4ZLF-J1 1SS176 E-152 KKM60	DIODE DIODE DIODE CONSTANT CURRENT DIODE IC(ISOLATION AMP)		
IC2 IC3 IC4 IC5 Q1 ,2			UPC4570C UPD4066BC UPC494C UPC1237HA 2SD1302	IC(OP AMP X2) IC(BILATERAL SWITCH X4) IC(SWITCHING REGULATOR) IC(POWER AMP) TRANSISTOR		
Q3 Q4 Q5 Q7 ,8 Q9 -12			2SA733(A)(Q,P) DTA124EFF DTC124EFF 2SK389 2SA992(F,E)	TRANSISTOR DIGITAL TRANSISTOR DIGITAL TRANSISTOR TRANSISTOR TRANSISTOR		
Q13 ,14 Q15 ,16 Q17 ,18 Q19 -22 Q23 ,24			2SC2631(R,S) 2SA1123(Q,R) 2SC3419 2SC2631(R,S) 2SC2590(Q,R)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
Q25 ,26 Q27 ,28 Q29 ,30 Q31 ,32 Q33			2SA1110(Q,R) 2SC4387*5 2SA1672*5 2SC1845(F,E) 2SD1266(Q,P)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
Q34 Q35 -40 Q41 ,42 Q43 Q44			2SB941 2SC3300 2SC2654(L,K) 2SA992(F,E) 2SA1534A(R,S)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
Q45 Q46 Q47 Q48 TH1 ,2			2SC945(A)(Q,P) 2SA733(A)(Q,P) 2SC3940A(R,S) 2SA733(A)(Q,P) PTH487A01BC222T	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR POSITIVE RESISTOR		
TH3		*	ERT-D2FGL103S	THERMISTOR		

E: Scandinavia &amp; Europe K: USA P: Canada W: Europe

U: PX(Far East, Hawaii) T: England M: Other Areas

UE: AAFES(Europe) X: Australia

## PACKING



SPECIFICATIONS

Audio section

Max Power Output	
Normal	180 W + 180 W
Bridged	360 W
Power Output	
Normal (20 Hz ~ 20 kHz, 4 Ω, less than 0.3% THD)	100 W + 100 W
Bridged (1 kHz, 4 Ω, 0.3% THD)	200 W
Power Output	
Normal (1 kHz, 2 Ω, 0.3% THD)	100 W + 100 W
Frequency Response (− 3 dB)	2 Hz ~ 100 kHz
Sensitivity (rated output) MAX.	0.1 V
MIN.	5.0 V
Input Impedance	10 kΩ
Damping Factor (100 Hz)	More than 200
Sub Woofer Frequency	30 ~ 150 Hz (variable)

General

Operating Voltage	14.4 V (11 ~ 16 V allowable)
Current Consumption (MAX.)	30 A
Dimensions	W: 260 mm (10-1/4)
	H: 50 mm (1-15/16)
	D: 300 mm (11-13/16)

KENWOOD follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.

KENWOOD poursuit une politique de progrès constants en ce qui concerne le développement. Pour cette raison, les spécifications sont sujettes à modifications sans préavis.

KENWOOD strebt ständige, Verbesserungen in der Entwicklung an. Daher bleiben Änderungen der technischen Daten jederzeit vorbehalten.

KENWOOD CORPORATION

Shionogi Shibuya Building, 17-5, 2-chome Shibuya, Shibuya-ku, Tokyo 150, Japan

KENWOOD U.S.A. CORPORATION

2201 East Dominguez Street, Long Beach, CA 90810;  
550 Clark Drive, Mount Olive, NJ 07828, U.S.A.

KENWOOD ELECTRONICS CANADA INC.

P.O. BOX 1075, 959 Gana Court, Mississauga, Ontario, Canada L4T 4C2

TRIO-KENWOOD U.K. LTD.

KENWOOD House, Dwight Road, Watford, Herts., Wd1 8eb United Kingdom

KENWOOD ELECTRONICS BENELUX N.V.

Mechelsesteenweg 418 B-1930 Zaventem, Belgium

KENWOOD ELECTRONICS DEUTSCHLAND GMBH

Rembrucker-Str. 15, 6056 Heusenstamm, West Germany

TRIO-KENWOOD FRANCE S.A.

13 Boulevard Ney, 75018 Paris, France

KENWOOD LINEAR S.p.A.

20125, MILANO-VIA ARBE, 50, ITALY

KENWOOD ELECTRONICS AUSTRALIA PTY, LTD. (INCORPORATED IN NSW)

4E Woodcock Place, Lane Cove, N.S.W. 2066, Australia

KENWOOD & LEE ELECTRONICS, LTD.

Wang Kee Building, 4th Floor, 34-37, Connaught Road, Central, Hong Kong